

Application No.: 10/501598
Docket No.: AD6856USPCT

AUG 18 2006

Page 2

Amendments to Claims

1. (Currently Amended) A process for preparing a low color, polyvinyl butyral sheet comprising the steps:

(I) admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and a surfactant;

(II) stabilizing the mixture obtained in step (I) by (a) raising the pH of the mixture to at least pH 10, (b) isolating the polyvinyl butyral resin composition by draining the liquid, and (c) washing the polyvinyl butyral resin composition with neutral pH water;

(III) plasticizing the polyvinyl butyral resin composition with from about 30 to about 50 pph of plasticizer selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate, dibutyl sebacate, and mixtures thereof, based on the dry weight of the resin;

(IV) mixing (a) a polyvinyl butyral bleaching compound selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates, and, optionally, (b) an antioxidant and a UV light stabilizer with the polyvinyl butyral resin composition; and

(V) extruding the polyvinyl butyral resin composition at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having a glass transition temperature (T_g) of greater than about 32°C and a YID of less than about 12.

2. (Previously presented) The process of Claim 1 wherein the process comprises the mixing with the antioxidant and the UV light stabilizer.

3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Cancelled)

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 3

10. (Previously presented) The process of Claim 1 wherein the bleaching compound is sodium dioctyl sulfosuccinate.

11. (Previously presented) The process of Claim 26 wherein the polyvinyl butyral is plasticized using a wet process.

12. (Previously presented) The process of Claim 26 wherein the polyvinyl butyral is plasticized using a dry process.

13. (Cancelled)

14. (Currently Amended) A plasticized polyvinyl butyral sheet composition consisting essentially of: polyvinylbutyral having a hydroxyl (OH) number of from about 15 to about 25; a plasticizer selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate and dibutyl sebacate or plasticizer and mixtures thereof present in an amount of from about 30 pph to about 50 pph, based on the dry weight of the polyvinyl butyral resin; a compound selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates ~~a surfactant; and optionally including either (i) a polyvinyl butyral bleaching compound, or (ii) an antioxidant and an ultraviolet (UV) light stabilizer, or (iii) both (i) and (ii),~~ wherein the sheet has a yellowness index (YID) color of less than 12, ~~and wherein the surfactant is the type that performs the function of a bleaching compound or the polyvinyl butyral bleaching compound is present.~~

15. (Currently Amended) The composition of Claim 14 wherein the plasticizer is the triethylene glycol di(2-ethylhexanoate).

16. (Previously presented) The composition of Claim 15 wherein the plasticizer is present in an amount of from about 30 to about 45 pph, by weight, based on the dry weight of the polyvinyl butyral resin.

17. (Cancelled)

18. (Currently Amended) The composition of Claim 16 wherein the polyvinyl butyral includes ~~a surfactant, a bleaching compound,~~ an antioxidant, and a UV light stabilizer.

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 4

19. (Cancelled)
20. (Currently Amended) The composition of Claim 15 wherein the ~~surfactant~~ compound is sodium dioctyl sulfosuccinate.
21. (Original) The composition of Claim 20 wherein the antioxidant is a bis-phenolic compound.
22. (Original) The composition of Claim 21 wherein the antioxidant is 2,2'-methylenebis(6-t-butyl-4-methylphenol).
23. (Previously presented) A laminate article comprising at least one layer of the polyvinyl butyral composition of Claim 14.
24. (Currently Amended) A process for preparing a low color, polyvinyl butyral sheet comprising the steps:
- (I) admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and a surfactant selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates ~~which also performs the function of a bleaching compound;~~
 - (II) stabilizing the mixture obtained in step (I) by (a) raising the pH of the mixture to at least pH 10, (b) isolating the resin by draining the liquid, and (c) washing the resin with neutral pH water;
 - (III) plasticizing the polyvinyl butyral resin composition with from about 30 to about 50 pph of plasticizer selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate and dibutyl sebacate, based on the dry weight of the polyvinyl butyral resin; and
 - (IV) ~~optionally mixing (a) a polyvinyl butyral bleaching compound and/or (b) an antioxidant and a UV light stabilizer, with the polyvinyl butyral resin composition; and~~
 - ~~(V)~~ extruding the polyvinyl butyral resin composition at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 5

a glass transition temperature (T_g) of greater than about 32°C and a YID of less than about 12.

25. (Currently Amended) The process of Claim 24 wherein the surfactant is selected from the group consisting of the sulfosuccinates.

26. (Currently Amended) A process for preparing a low color, polyvinyl butyral sheet comprising the steps:

- (I) admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and sodium dialkyl sulfosuccinate;
- (II) stabilizing the mixture obtained in step (I) by
 - (a) raising the pH of the mixture to at least pH 10, (b) isolating the resin by draining the liquid, and (c) washing the resin with neutral pH water;
- (III) plasticizing the polyvinyl butyral resin composition with from about 30 to about 50 pph of plasticizer, based on the dry weight of the polyvinyl butyral resin, wherein the plasticizer is selected from the group consisting of triethylene glycol di(2-ethylhexanoate), tetraethylene glycol diheptanoate, dibutyl sebacate, and mixtures thereof; and
- (IV) ~~optionally mixing (a) a polyvinyl butyral bleaching compound and/or (b) an antioxidant and a UV light stabilizer, with the polyvinyl butyral resin composition; and~~
- ~~(V)~~ extruding the polyvinyl butyral resin composition at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having a glass transition temperature (T_g) of greater than about 32°C and a YID of less than about 12.

27. (Previously presented) The process of Claim 26 wherein the sodium dialkyl sulfosuccinate is sodium dioctyl sulfosuccinate.

28. (Previously presented) The process of Claim 24 wherein the surfactant is included in amount of from about 0.01

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 6

to about 0.85 pph by weight, based on the weight of polyvinyl alcohol.

29. (Previously presented) The process of Claim 26 wherein the dialkylsulfosuccinate is included in amount of from about 0.01 to about 0.85 pph by weight, based on the weight of polyvinyl alcohol.

30. (Previously presented) The process of Claim 27 wherein the sodium dioctyl sulfosuccinate is included in amount of from about 0.01 to about 0.85 pph by weight, based on the weight of polyvinyl alcohol.

31. (Previously presented) The process of Claim 24 wherein the surfactant is included in amount of from about 0.10 to about 0.80 pph by weight, based on the weight of polyvinyl alcohol.

32. (Previously presented) The process of Claim 26 wherein the sodium dialkyl sulfosuccinate is included in amount of from about 0.10 to about 0.80 pph by weight, based on the weight of polyvinyl alcohol.

33. (Previously presented) The process of Claim 27 wherein the sodium dioctyl sulfosuccinate is included in amount of from about 0.10 to about 0.80 pph by weight, based on the weight of polyvinyl alcohol.

34. (Previously presented) The process of Claim 24 further comprising the mixing the antioxidant and the UV light stabilizer with the polyvinyl butyral resin composition.

35. (Currently Amended) The process of Claim 26 further comprising ~~the mixing the~~ an antioxidant and ~~the a~~ a UV light stabilizer with the polyvinyl butyral resin composition after the plasticizing and prior to the extruding.

36. (Previously presented) The process of Claim 35 wherein the antioxidant is included in an amount of from about 0.01 to about 0.6%, based on the total weight of the sheet.

37. (Previously presented) The process of Claim 36 wherein the antioxidant is a bis-phenolic antioxidant.

38. (Previously presented) The process of Claim 36 wherein the antioxidant is present in amount of from about 0.03 to about 0.3%, based on the total weight of the sheet.

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 7

39. (Previously presented) The process of Claim 38 wherein the antioxidant is a bis-phenolic antioxidant selected from the group consisting of 2,2'-ethylidenebis(4,6-di-t-butylphenol); 4,4'-butylidenebis(2-t-butyl-5-methylphenol); 2,2'-isobutylidenebis(4,6-dimethylphenol); and 2,2'-methylenebis(6-t-butyl-4-methylphenol).

40. (Previously presented) The process of Claim 24 wherein the YID is less than about 8.

41. (Previously presented) The process of Claim 1 wherein the bleaching compound is a sodium dialkyl sulfosuccinate.

42. (Cancelled)

43. (Cancelled)

44. (Cancelled)

45. (Cancelled)

46. (Previously presented) The process of Claim 1 wherein the polyvinyl butyral bleaching compound is selected from the group consisting of sodium or potassium bisulfite, and tetramethylammonium bisulfite.

47. (Previously presented) The process of Claim 1 wherein the polyvinyl butyral bleaching compound is present in an amount of from about 0.01 to about 0.85 parts per hundred, based on the weight of polyvinyl alcohol used in the preparation of the polyvinyl butyral resin composition.

48. (Previously presented) The process of Claim 1 wherein the polyvinyl butyral bleaching compound is present in an amount of from about 0.10 to about 0.75 parts per hundred, based on the weight of polyvinyl alcohol used in the preparation of the polyvinyl butyral resin composition.

49. (Previously presented) The process of Claim 1 wherein the plasticizer is triethylene glycol di(2-ethylhexanoate).

50. (Previously presented) The process of Claim 24 wherein the plasticizer is triethylene glycol di(2-ethylhexanoate).

51. (Previously presented) The process of Claim 26 wherein the plasticizer is triethylene glycol di(2-ethylhexanoate).

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 8

52. (Previously presented) The process of Claim 32 wherein the plasticizer is triethylene glycol di(2-ethylhexanoate) and is present in an amount of from about 30 to about 45 pph, by weight, based on the dry weight of the polyvinyl butyral resin.

53. (Previously presented) The process of Claim 52 further comprising the mixing the antioxidant and the UV light stabilizer with the polyvinyl butyral resin composition, wherein the antioxidant is included in an amount of from about 0.01 to about 0.6%, based on the total weight of the sheet, and wherein the antioxidant is a bis-phenolic antioxidant.

54. (Previously presented) The process of Claim 24 wherein the admixing is carried out at a temperature of 5 to 100°C.

55. (Previously presented) The process of Claim 52 wherein the admixing is carried out at a temperature of about 90°C.

56. (Previously presented) A polyvinyl butyral sheet obtained by the process of any of Claims 1, 24, 26 and 52.

57. (Previously presented) The composition of Claim 15 wherein the surfactant is a sulfosuccinate.

58. (New) The process of Claim 1 wherein the plasticizer is the triethylene glycol di(2-ethylhexanoate).

59. (New) The process of Claim 58 wherein the polyvinyl butyral bleaching compound is selected from the organic bisulfites.

60. (New) The process of Claim 58 wherein the polyvinyl butyral bleaching compound is selected from the inorganic bisulfites.

61. (New) The process of Claim 58 wherein the polyvinyl butyral bleaching compound is selected from the sulfosuccinates.

62. (New) The process of Claim 58 wherein the polyvinyl butyral bleaching compound is sodium dialkyl sulfosuccinate.

63. (New) The process of Claim 58 wherein the bleaching compound is sodium dioctyl sulfosuccinate.

64. (New) The process of Claim 1 wherein the plasticizer is the tetraethylene glycol diheptanoate.

Application No.: 10/501598
Docket No.: AD6856USPCT

Page 9

65. (New) The process of Claim 1 wherein the plasticizer is the dibutyl sebacate.

66. (New) A process for preparing a low color, polyvinyl butyral sheet comprising the steps:

- (I) admixing polyvinyl alcohol, butyraldehyde, an acid or mixture of acids, water, and a surfactant selected from the group consisting of organic bisulfites, inorganic bisulfites and sulfosuccinates;
- (II) stabilizing the mixture obtained in step (I) by (a) raising the pH of the mixture to at least pH 10, (b) isolating the resin by draining the liquid, and (c) washing the resin with neutral pH water;
- (III) plasticizing the polyvinyl butyral resin composition with from about 30 to about 50 pph of plasticizer selected from the group consisting of diesters obtained by (a) the reaction of triethylene glycol or tetraethylene glycol with aliphatic carboxylic acids having from 6 to 10 carbon atoms and (b) the reaction of sebacic acid with aliphatic alcohols having from 1 to 18 carbon atoms, and mixtures thereof, based on the dry weight of the polyvinyl butyral resin; and
- (IV) extruding the polyvinyl butyral resin composition at a temperature of from about 175°C to about 225°C to obtain a polyvinyl butyral sheet having a glass transition temperature (T_g) of greater than about 32°C and a YID of less than about 12.

67. (New) The process of Claim 66 wherein the plasticizer is selected from the group consisting of the diesters obtained by the reaction of triethylene glycol or tetraethylene glycol with aliphatic carboxylic acids having from 6 to 10 carbon atoms.

68. (New) The process of Claim 67 wherein the surfactant is sodium dioctyl sulfosuccinate.